BioMap and Living Waters

Guiding Land Conservation for Biodiversity in Massachusetts

Core Habitats of Sandwich

This report and associated map provide information about important sites for biodiversity conservation in your area.

This information is intended for conservation planning, and is not intended for use in state regulations.

Produced by:

Natural Heritage & Endangered Species Program
Massachusetts Division of Fisheries and Wildlife
Executive Office of Environmental Affairs
Commonwealth of Massachusetts

Produced in 2004

BioMap and Living Waters:
Guiding Land Conservation for Biodiversity in Massachusetts

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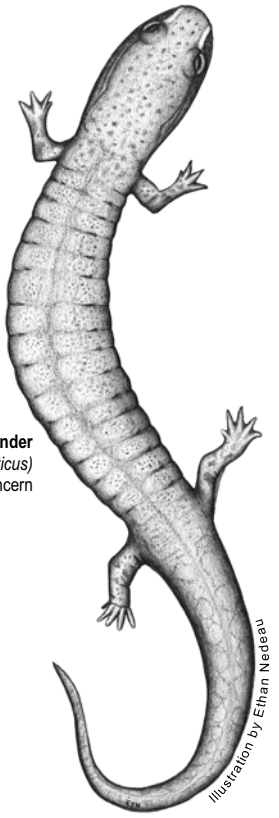
* Depending on the location of Core Habitats, your city or town may not have all of these sections.



Spring Salamander
(Gyrinophilus porphyriticus)
Species of Special Concern

Funding for this project was made available by the Executive Office of Environmental Affairs, contributions to the Natural Heritage & Endangered Species Fund, and through the State Wildlife Grants Program of the US Fish & Wildlife Service.

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For more information on rare species and natural communities, please see our fact sheets online at ***www.nhesp.org***

BioMap and Living Waters:
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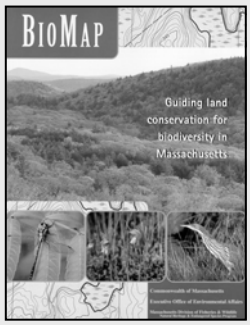
Introduction

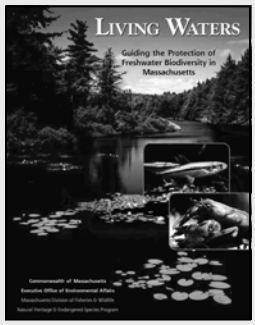
In this report, the Natural Heritage & Endangered Species Program provides you with site-specific biodiversity information for your area. Protecting our biodiversity today will help ensure the full variety of species and natural communities that comprise our native flora and fauna will persist for generatons to come.

The information in this report is the result of two statewide biodiversity conservation planning projects, ***BioMap*** and ***Living Waters***. The goal of the BioMap project, completed in 2001, was to identify and delineate the most important areas for the long-term viability of terrestrial, wetland, and estuarine elements of biodiversity in Massachusetts. The goal of the Living Waters project, completed in 2003, was to identify and delineate the rivers, streams, lakes, and ponds that are important for freshwater biodiversity in the Commonwealth. These two conservation plans are based on documented observations of rare species, natural communities, and exemplary habitats.

What is a Core Habitat?

Both BioMap and Living Waters delineate ***Core Habitats*** that identify the most critical sites for biodiversity conservation across the state. Core Habitats represent habitat for the state's most viable rare plant and animal populations and include exemplary natural communities and aquatic habitats. Core Habitats represent a wide diversity of rare species and natural communities (see Table 1), and these areas are also thought to contain virtually all of the other described species in Massachusetts. Statewide, BioMap Core Habitats encompass 1,380,000 acres of uplands and wetlands, and Living Waters identifies 429 Core Habitats in rivers, streams, lakes, and ponds.





Get your copy of the ***BioMap*** and ***Living Waters*** reports! Contact Natural Heritage at 508-792-7270, Ext. 200 or email natural.heritage@state.ma.us. Posters and detailed technical reports are also available.

Core Habitats and Land Conservation

One of the most effective ways to protect biodiversity for future generations is to protect Core Habitats from adverse human impacts through land conservation. For Living Waters Core Habitats, protection efforts should focus on the ***riparian areas***, the areas of land adjacent to water bodies. A naturally vegetated buffer that extends 330 feet (100 meters) from the water's edge helps to maintain cooler water temperature and to maintain the nutrients, energy, and natural flow of water needed by freshwater species.

In Support of Core Habitats

To further ensure the protection of Core Habitats and Massachusetts' biodiversity in the long-term, the BioMap and Living Waters projects identify two additional areas that help support Core Habitats.

In BioMap, areas shown as ***Supporting Natural Landscape*** provide buffers around the Core Habitats, connectivity between Core Habitats, sufficient space for ecosystems to function, and contiguous undeveloped habitat for common species. Supporting Natural Landscape was

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generated using a Geographic Information Systems (GIS) model, and its exact boundaries are less important than the general areas that it identifies. Supporting Natural Landscape represents potential land protection priorities once Core Habitat protection has been addressed.

In Living Waters, ***Critical Supporting Watersheds*** highlight the immediate portion of the watershed that sustains, or possibly degrades, each freshwater Core Habitat. These areas were also identified using a GIS model. Critical Supporting Watersheds represent developed and undeveloped lands, and can be quite large. Critical Supporting Watersheds can be helpful in land-use planning, and while they are not shown on these maps, they can be viewed in the Living Waters report or downloaded from www.mass.gov/mgis.

Understanding Core Habitat Species, Community, and Habitat Lists

What's in the List?

Included in this report is a list of the species, natural communities, and/or aquatic habitats for each Core Habitat in your city or town. The lists are organized by Core Habitat number.

For the larger Core Habitats that span more than one town, the species and community lists refer to the entire Core Habitat, not just the portion that falls within your city or town. For a list of all the state-listed rare species within your city or town's boundary, whether or not they are in Core Habitat, please see the town rare species lists available at www.nhesp.org.

The list of species and communities within a Core Habitat contains only the species and natural communities that were explicitly included in a given BioMap or Living Waters Core Habitat. Other rare species or examples of other natural communities may fall within the Core Habitat, but for various reasons are not included in the list. For instance, there are a few rare species that are omitted from the list or summary because of their particular sensitivity to the threat of collection. Likewise, the content of many very small Core Habitats are not described in this report or list, often because they contain a single location of a rare plant

Table 1. The number of rare species and types of natural communities explicitly included in the BioMap and Living Waters conservation plans, relative to the total number of native species statewide.

BioMap

	Species and Verified Natural Community Types	
Biodiversity Group	**Included in BioMap**	**Total Statewide**
Vascular Plants	246	1,538
Birds	21	221 breeding species
Reptiles	11	25
Amphibians	6	21
Mammals	4	85
Moths and Butterflies	52	An estimated 2,500 to 3,000
Damselflies and Dragonflies	25	An estimated 165
Beetles	10	An estimated 2,500 to 4,000
Natural Communities	92	> 105 community types

Living Waters

	Species	
Biodiversity Group	**Included in Living Waters**	**Total Statewide**
Aquatic Vascular Plants	23	114
Fishes	11	57
Mussels	7	12
Aquatic Invertebrates	23	An estimated > 2500

species. Some Core Habitats were created for suites of common species, such as forest birds, which are particularly threatened by habitat fragmentation. In these cases, the individual common species are not listed.

What does 'Status' mean?

The Division of Fisheries and Wildlife determines a status category for each rare species listed under the Massachusetts Endangered Species Act, M.G.L. c.131A, and its implementing regulations, 321 CMR 10.00. Rare species are categorized as Endangered, Threatened, or of Special Concern according to the following:

- ***Endangered*** species are in danger of extinction throughout all or a significant portion of their range or are in danger of extirpation from Massachusetts.
- ***Threatened*** species are likely to become Endangered in Massachusetts in the foreseeable future throughout all or a significant portion of their range.
- ***Special Concern*** species have suffered a decline that could threaten the species if allowed to continue unchecked or occur in such small numbers or with such restricted distribution or specialized habitat requirements that they could easily become Threatened in Massachusetts.

In addition, the Natural Heritage & Endangered Species Program maintains an unofficial ***watch list*** of plants that are tracked due to potential conservation interest or concern, but are not regulated under the Massachusetts Endangered Species Act or other laws or regulations. Likewise, described natural communities are not regulated any laws or regulations, but they can help to identify ecologically important areas that are worthy of protection. The status of natural communities reflects the documented number and acreages of each community type in the state:

- ***Critically Imperiled*** communities typically have 5 or fewer documented sites or have very few remaining acres in the state.
- ***Imperiled*** communities typically have 6-20 sites or few remaining acres in the state.
- ***Vulnerable*** communities typically have 21-100 sites or limited acreage across the state.
- ***Secure*** communities typically have over 100 sites or abundant acreage across the state; however excellent examples are identified as Core Habitat to ensure continued protection.

Legal Protection of Biodiversity

BioMap and Living Waters present a powerful vision of what Massachusetts would look like with full protection of the land that supports most of our biodiversity. To create this vision, some populations of state-listed rare species were deemed more likely to survive over the long-term than others.

Regardless of their potential viability, all sites of state-listed species have full legal protection under the Massachusetts Endangered Species Act (M.G.L. c.131A) and its implementing regulations (321 CMR 10.00). Habitat of state-listed wildlife is also protected under the Wetlands Protection Act Regulations (310 CMR 10.37 and 10.59). The ***Massachusetts Natural Heritage Atlas*** shows **Priority Habitats**, which are used for regulation under the Massachusetts Endangered Species Act and Massachusetts Environmental Policy Act (M.G.L. c.30) and **Estimated Habitats**, which are used for regulation of rare wildlife habitat under the Wetlands Protection Act. For more information on rare species regulations, see the *Massachusetts Natural Heritage Atlas*, available from the Natural Heritage & Endangered Species Program in book and CD formats.

BioMap and Living Waters are conservation planning tools and do not, in any way, supplant the Estimated and Priority Habitat Maps which have regulatory significance. Unless and until the combined BioMap and Living Waters vision is fully realized, we must continue to protect all populations of our state-listed species and their habitats through environmental regulation.

Natural Heritage & Endangered Species Program

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Understanding Core Habitat Summaries

Following the BioMap and Living Waters Core Habitat species and community lists, there is a descriptive summary of each Core Habitat that occurs in your city or town. This summary highlights some of the outstanding characteristics of each Core Habitat, and will help you learn more about your city or town's biodiversity. You can find out more information about many of these species and natural communities by looking at specific ***fact sheets*** at www.nhesp.org.

Next Steps

BioMap and Living Waters were created in part to help cities and towns prioritize their land protection efforts. While there are many reasons to conserve land – drinking water protection, recreation, agriculture, aesthetics, and others – BioMap and Living Waters Core Habitats are especially helpful to municipalities seeking to protect the rare species, natural communities, and overall biodiversity within their boundaries. Please use this report and map along with the rare species and community fact sheets to appreciate and understand the biological treasures in your city or town.

Protecting Larger Core Habitats

Core Habitats vary considerably in size. For example, the average BioMap Core Habitat is 800 acres, but Core Habitats can range from less than 10 acres to greater than 100,000 acres. These larger areas reflect the amount of land needed by some animal species for breeding, feeding, nesting, overwintering, and long-term survival. Protecting areas of this size can be very challenging, and requires developing partnerships with neighboring towns.

Prioritizing the protection of certain areas within larger Core Habitats can be accomplished through further consultation with Natural Heritage Program biologists, and through additional field research to identify the most important areas of the Core Habitat.

Additional Information

If you have any questions about this report, or if you need help protecting land for biodiversity in your community, the Natural Heritage & Endangered Species Program staff looks forward to working with you.

Contact the Natural Heritage & Endangered Species Program:

by Phone *508-792-7270, Ext. 200*

by Fax: *508-792-7821*

by Email: *natural.heritage@state.ma.us*.

by Mail: *North Drive*
Westborough, MA 01581

The GIS datalayers of BioMap and Living Waters Core Habitats are available for download from MassGIS: www.mass.gov/mgis

Check out www.nhesp.org for information on:

- Rare species in your town
- Rare species fact sheets
- BioMap and Living Waters projects
- Natural Heritage publications, including:
  - Field guides
  - Natural Heritage Atlas, and more!

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BioMap: Species and Natural Communities

Sandwich

Core Habitat BM1237

Plants

Common Name	Scientific Name	Status
Bushy Rockrose	*Helianthemum dumosum*	Special Concern

Invertebrates

Common Name	Scientific Name	Status
Dune Noctuid Moth	*Oncocnemis riparia*	Special Concern
Gerhard's Underwing Moth	*Catocala herodias gerhardi*	Special Concern

Vertebrates

Common Name	Scientific Name	Status
Four-toed Salamander	*Hemidactylium scutatum*	Special Concern
Songbird Migration Habitat		----------
Wading Bird Habitat		----------

Core Habitat BM1242

Vertebrates

Common Name	Scientific Name	Status
Piping Plover	*Charadrius melodus*	Threatened

Core Habitat BM1248

Vertebrates

Common Name	Scientific Name	Status
Bird Migration Habitat		----------

Core Habitat BM1250

Natural Communities

Common Name	Scientific Name	Status
Coastal Atlantic White Cedar Swamp		Imperiled
Coastal Plain Pondshore		Imperiled

BioMap: Species and Natural Communities

Sandwich

Kettlehole Level Bog		Imperiled
Pitch Pine - Scrub Oak Community		Imperiled

Plants

Common Name	Scientific Name	Status
Adder's-Tongue Fern	*Ophioglossum pusillum*	Threatened
Broad Tinker's-Weed	*Triosteum perfoliatum*	Endangered
Creeping St. John's-Wort	*Hypericum adpressum*	Threatened
Long-Beaked Bald-Sedge	*Rhynchospora scirpoides*	Special Concern
Maryland Meadow Beauty	*Rhexia mariana*	Endangered
Ovate Spike-Sedge	*Eleocharis ovata*	Endangered
Pondshore Knotweed	*Polygonum puritanorum*	Special Concern
Purple Milkweed	*Asclepias purpurascens*	Endangered
Redroot	*Lachnanthes caroliana*	Special Concern
Reticulate Nut-Sedge	*Scleria reticularis*	Watch Listed
Sandplain Flax	*Linum intercursum*	Special Concern
Short-Beaked Bald-Sedge	*Rhynchospora nitens*	Threatened
Terete Arrowhead	*Sagittaria teres*	Special Concern
Torrey's Beak-Sedge	*Rhynchospora torreyana*	Endangered
Weak Rush	*Juncus debilis*	Endangered
Wright's Panic-grass	*Dichanthelium wrightianum*	Special Concern

Invertebrates

Common Name	Scientific Name	Status
Barrens Buckmoth	*Hemileuca maia*	Special Concern
Barrens Daggermoth	*Acronicta albarufa*	Threatened
Blueberry Sallow	*Apharetra dentata*	----------
Chain Dot Geometer	*Cingilia catenaria*	Special Concern
Coastal Heathland Cutworm	*Abagrotis nefascia benjamini*	Special Concern
Coastal Swamp Metarranthis Moth	*Metarranthis pilosaria*	Special Concern

Comet Darner	*Anax longipes*	Special Concern
Dune Noctuid Moth	*Oncocnemis riparia*	Special Concern
Frosted Elfin	*Callophrys irus*	Special Concern
Gerhard's Underwing Moth	*Catocala herodias gerhardi*	Special Concern
Melsheimer's Sack Bearer	*Cicinnus melsheimeri*	Threatened
New England Bluet	*Enallagma laterale*	Special Concern
Oak Hairstreak	*Satyrium favonius*	Special Concern
Pine Barrens Bluet	*Enallagma recurvatum*	Threatened
Pine Barrens Itame	*Itame sp. 1 near inextricata*	Special Concern
Pine Barrens Zale	*Zale sp. 1 near lunifera*	Special Concern
Spatterdock Darner	*Aeshna mutata*	Special Concern
Spiny Oakworm	*Anisota stigma*	Special Concern
Straight-lined Mallow moth	*Bagisara rectifascia*	Special Concern
The Pink Streak	*Faronta rubripennis*	Threatened
Tule Bluet	*Enallagma carunculatum*	Special Concern
Unexpected Cycnia	*Cycnia inopinatus*	Threatened
Water-Willow Stem Borer	*Papaipema sulphurata*	Threatened
Waxed Sallow Moth	*Chaetaglaea cerata*	Special Concern

Vertebrates

Common Name	Scientific Name	Status
Eastern Box Turtle	*Terrapene carolina*	Special Concern
Grasshopper Sparrow	*Ammodramus savannarum*	Threatened
Northern Harrier	*Circus cyaneus*	Threatened
Upland Sandpiper	*Bartramia longicauda*	Endangered

Core Habitat BM1252

Vertebrates

Common Name	Scientific Name	Status
Common Tern	*Sterna hirundo*	Special Concern

Least Tern	*Sterna antillarum*	Special Concern
Piping Plover	*Charadrius melodus*	Threatened

Core Habitat BM1269

Natural Communities

Common Name	Scientific Name	Status
Coastal Interdunal Marsh/Swale		Critically Imperiled
Estuarine Intertidal: Salt Marsh		Vulnerable
Maritime Dune Community		Imperiled
Maritime Juniper Woodland/Shrubland		Critically Imperiled
Maritime Oak - Holly Forest/Woodland		Critically Imperiled
Maritime Pitch Pine On Dunes		Critically Imperiled

Plants

Common Name	Scientific Name	Status
Brackish Bulrush	*Scirpus cylindricus*	Watch Listed
Plymouth Gentian	*Sabatia kennedyana*	Special Concern
Swamp Oats	*Sphenopholis pensylvanica*	Threatened

Invertebrates

Common Name	Scientific Name	Status
Coastal Heathland Cutworm	*Abagrotis nefascia benjamini*	Special Concern

Vertebrates

Common Name	Scientific Name	Status
Common Tern	*Sterna hirundo*	Special Concern
Diamondback Terrapin	*Malaclemys terrapin*	Threatened
Eastern Spadefoot	*Scaphiopus holbrookii*	Threatened
Least Tern	*Sterna antillarum*	Special Concern
Piping Plover	*Charadrius melodus*	Threatened

BioMap: Species and Natural Communities

Sandwich

Core Habitat BM1272

Plants

Common Name	Scientific Name	Status
Small Site for Rare Plant		

Core Habitat BM1278

Invertebrates

Common Name	Scientific Name	Status
Water-Willow Stem Borer	*Papaipema sulphurata*	Threatened

Core Habitat BM1285

Plants

Common Name	Scientific Name	Status
Small Site for Rare Plant		

Core Habitat BM1289

Plants

Common Name	Scientific Name	Status
Small Site for Rare Plant		

Core Habitat BM1291

Plants

Common Name	Scientific Name	Status
New England Blazing Star	*Liatris scariosa var. novae-angliae*	Special Concern
Pondshore Knotweed	*Polygonum puritanorum*	Special Concern
Redroot	*Lachnanthes caroliana*	Special Concern
Rough Panic-grass	*Dichanthelium scabriusculum*	Threatened

Invertebrates

Common Name	Scientific Name	Status
Comet Darner	*Anax longipes*	Special Concern

New England Bluet	*Enallagma laterale*	Special Concern
Oak Hairstreak	*Satyrium favonius*	Special Concern

Vertebrates

Common Name	Scientific Name	Status
Eastern Box Turtle	*Terrapene carolina*	Special Concern

Core Habitat BM1292

Plants

Common Name	Scientific Name	Status
Small Site for Rare Plant		

Core Habitat BM1293

Natural Communities

Common Name	Scientific Name	Status
Estuarine Intertidal: Salt Marsh		Vulnerable

Core Habitat BM1320

Plants

Common Name	Scientific Name	Status
Small Site for Rare Plant		

Core Habitat BM1332

Plants

Common Name	Scientific Name	Status
Small Site for Rare Plant		

Core Habitat BM1336

Plants

Common Name	Scientific Name	Status
Small Site for Rare Plant		

BioMap: Species and Natural Communities

Sandwich

Core Habitat BM1339

Natural Communities

Common Name	Scientific Name	Status
Coastal Plain Pondshore		Imperiled

Plants

Common Name	Scientific Name	Status
Pondshore Knotweed	*Polygonum puritanorum*	Special Concern
Redroot	*Lachnanthes caroliana*	Special Concern

Core Habitat BM1341

Plants

Common Name	Scientific Name	Status
Small Site for Rare Plant		

Core Habitat BM1342

Plants

Common Name	Scientific Name	Status
Small Site for Rare Plant		

Core Habitat BM1345

Natural Communities

Common Name	Scientific Name	Status
Coastal Plain Pondshore		Imperiled

Plants

Common Name	Scientific Name	Status
Small Site for Rare Plant		

BioMap: Species and Natural Communities

Sandwich

Core Habitat BM1347

Plants

Common Name	Scientific Name	Status
Small Site for Rare Plant		

Core Habitat BM1348

Plants

Common Name	Scientific Name	Status
Small Site for Rare Plant		

Core Habitat BM1350

Natural Communities

Common Name	Scientific Name	Status
Coastal Plain Pondshore		Imperiled

Core Habitat BM1354

Plants

Common Name	Scientific Name	Status
Small Site for Rare Plant		

BioMap: Core Habitat Summaries

Sandwich

Core Habitat BM1237

This Core Habitat encompasses salt marsh, freshwater wetlands, and adjacent uplands landward of Scusset and Sagamore beaches. The area supports a population of the globally rare Bushy Rockrose and provides habitat for Four-toed Salamanders, a variety of birds, and two rare species of moths.

Plants

The globally rare Bushy Rockrose (Species of Special Concern) is growing here in an open community resembling a sandplain grassland.

Invertebrates

This Core Habitat includes an unfragmented complex of coastal habitats, including scrub oak thickets inhabited by Gerhard's Underwing moth and sand dunes that are habitat for the rare Dune Noctuid moth. This Core Habitat is located in close proximity to similar habitats at the Massachusetts Military Reservation, which allows for dispersal of rare moths and other flying invertebrates between these two locations.

Vertebrates

This Core Habitat contains freshwater wetland habitat for Four-toed Salamanders, salt marshes for wading birds, and coastal forest and shrubland habitat for migrant songbirds. Land protection of the remaining unprotected areas should aim to protect the largest possible contiguous block of salt marsh, wetlands, and adjacent uplands.

Core Habitat BM1242

Vertebrates

Scusset and Sagamore Beaches support breeding Piping Plovers. Potential threats to nesting coastal waterbirds include habitat alteration and loss, human disturbance (including dogs), and predation. Annual protection from these threats is needed.

Core Habitat BM1248

Vertebrates

Despite its relatively small size, this tract provides valuable habitat for migrating landbirds near the coast because of its location along Cape Cod Bay and the Cape Cod Canal. Its diverse woodland and shrublands provide excellent cover for migrant birds and support a variety of berry and seed producing plants. Preservation of a number of these patches of forest and shrublands along the increasingly developed Massachusetts coastline will benefit dozens of species of migrant landbirds in spring and fall.

BioMap: Core Habitat Summaries

Sandwich

Core Habitat BM1250

This large Core Habitat encompasses two globally important types of natural communities, the Pitch Pine-Scrub Oak community and the Coastal Plain Pond community. These and other habitats support two dozen rare species of moths, butterflies, dragonflies, and damselflies, including some of the largest and most viable populations in the state for several of these insect species. The Core Habitat also contains a diversity of rare plant species, many of which are associated with Coastal Plain Pondshores. Further protecting this Core Habitat's large Pine-Oak woodlands and barrens may provide the best opportunity in the state to conserve viable populations of Eastern Box Turtles. This is also one of the most important areas in New England for the conservation of landbirds characteristic of these habitats. Except for a portion within the Crane Wildlife Management Area in Falmouth, much of this important Core Habitat is not explicitly protected for biodiversity conservation.

Natural Communities

This large Core Habitat encompasses several areas of the Pitch Pine-Scrub Oak natural community type, including an unusual example in Mashpee with small Atlantic White Cedar Bogs included. The largest area of Pitch Pine-Scrub Oak community is in the Camp Edwards area and forms an important habitat connection with the Pitch Pine-Scrub Oak community to the north in Plymouth. Pitch Pine-Scrub Oak communities are globally rare, fire dependant shrub-dominated communities, with scattered to dense trees. They provide habitat for many rare species, and develop on dry, poor soils, usually made up primarily of sand. This Core Habitat also contains a pristine and well-buffered Coastal Plain Pondshore community with intact pondshore vegetation unaffected by disturbances, cranberry operations, or public water supply wells. Coastal Plain Pondshores are globally rare herbaceous communities of exposed pondshores with a distinct Coastal Plain flora. Water levels change with the water table, typically leaving an exposed shoreline in late summer where many rare species grow.

Plants

More than a dozen species of rare plants is found growing in various habitats within this large Core Habitat. Among them is the inconspicuous Adder's-Tongue Fern, usually found in wet meadows. Also present are the Long-Beaked Bald-Sedge and Torrey's Beak-Sedge, two members of the sedge family found along Coastal Plain pondshores. In fact, many of the rare plant species found within this area are associated with Coastal Plain pondshore natural communities.

Invertebrates

This Core Habitat supports no fewer than 24 invertebrate species that are listed as Endangered, Threatened, or Species of Special Concern in Massachusetts, including 19 species of moths and butterflies and five species of dragonflies and damselflies. One of these species is found nowhere else in Massachusetts. For many others, one of their largest and most viable populations is found within this Core Habitat. Besides barrens species such as the Frosted Elfin butterfly, the Melsheimer's Sack Bearer moth, and the Barrens Daggermoth, this Core Habitat includes many other habitats for rare invertebrates, including heathlands inhabited by species such as the Chain Dot Geometer moth and the Waxed Sallow moth; acidic shrub swamps and kettlehole bogs that are habitat for the Coastal Swamp Metarranthis moth and the Water-willow Stem Borer moth; sandplain grasslands that provide habitat for the Pink Streak moth and the Unexpected Cycnia moth; and Coastal Plain ponds inhabited by the Comet Darner dragonfly and the Pine Barrens Bluet damselfly.

Vertebrates

Collectively, the large and relatively unfragmented tracts of pine-oak woodlands and barrens contained within this Core Habitat may be the single most important area for the long-term conservation of viable populations of Eastern Box Turtles in Massachusetts. This is also one of the most important areas in New England for the conservation of landbirds characteristic of these habitats. Significant breeding populations of Whip-poor-wills are still present. This was one of the most important breeding sites for Upland Sandpipers and Grasshopper Sparrows in southern New England, but grassland habitat has declined substantially during the past 20 years due to vegetative succession resulting from lack of mowing or burning. Both of these species of grassland birds would benefit from management to increase the acreage of contiguous grassland on the cantonment area of the Massachusetts Military Reservation and to minimize mowing on the Otis Air National Guard airfield during the May 1 to July 31 nesting season. Northern Harriers use the extensive shrublands and remaining grasslands for nesting and foraging. Protection of the remaining undeveloped portions of this area would preserve a minimally fragmented 12 mile-long tract of oak-pine woodland and barrens habitats extending from the northern edge of Falmouth's urban areas north to the Cape Cod Canal.

Core Habitat BM1252

Vertebrates

Town Beach, Springhill Beach, and Old Harbor Beach support breeding Piping Plovers, Least Terns, and formerly Common Terns. Springhill Beach is one of the largest breeding sites in the state for breeding Piping Plovers. Potential threats to nesting coastal waterbirds include habitat alteration and loss, human disturbance (including dogs), and predation. Annual protection from these threats is needed.

BioMap: Core Habitat Summaries

Sandwich

Core Habitat BM1269

The size of this area, the mix of natural communities, and their excellent condition make this coastal Core Habitat especially important for protecting native biodiversity. The area encompasses both Sandy Neck and the Great Marshes, and supports significant populations of Diamondback Terrapins and Eastern Spadefoot toads, as well as breeding Least Terns, Common Terns, and one of the largest concentrations of breeding Piping Plovers in the state. It also includes habitat for rare coastal moth species, as well as rare plants such as the Brackish Bulrush. Much of this Core Habitat is on protected municipal land, and further land protection would help ensure the viability of the rare species found here.

Natural Communities

This Core Habitat contains a 1000-acre dune system with a large complex of Maritime Forest communities. Across a three-mile stretch of Maritime Dunes, there are over 25 swales supporting excellent Coastal Interdunal Marsh vegetation. The condition and quality of all of these communities are excellent. Behind the barrier beach and maritime communities is a part of the largest contiguous acreage of Estuarine Intertidal Salt Marsh on Cape Cod. The Salt Marsh community type is a graminoid-dominated, tidally flooded coastal community with several vegetative zones. Salt Marshes form in areas subject to oceanic tides, but sheltered from wave energy. Here the Salt Marsh contains an excellent variety of microhabitats and consequently an excellent diversity of plants, algae, and animals. It is well-buffered by natural lands, including many other high-quality natural communities. The size of this area, the mix of natural communities, and their excellent condition make this Core Habitat especially important for supporting native biodiversity.

Plants

The Brackish Bulrush is a member of the sedge family that is rare throughout the New England region. It is found in coastal wetland habitats, and is found here near the edge of a large salt marsh. Also within this Core Habitat is a population of the Threatened Swamp Oats, which grows in freshwater forested wetlands, usually near the coast.

Invertebrates

This Core Habitat includes habitat for rare moths such as the Coastal Heathland Cutworm. It is likely that Sandy Neck and the Great Marsh are inhabited by additional rare coastal moth species, such as the Dune Noctuid moth, the Drunk Apamea moth, the Spartina Borer moth, and other species.

Vertebrates

This Core Habitat contains widespread salt marsh, extensive tidal creeks, beaches, dune areas, shallow waters, and sandy uplands that support Diamondback Terrapins. Approximately 100 nesting observations are known from the late 1970s. Multiple sightings of adults have been documented more recently such that Sandy Neck supports one of the largest Diamondback Terrapin populations in Massachusetts. It also supports significant populations of Eastern Spadefoot toads. Potential threats to Diamondback Terrapins include mortality caused by off-road vehicles and entrapment by marine debris. Off-road vehicle use in the back-dune areas of Sandy Neck may also impact Eastern Spadefoot toads.

Sandy Neck supports breeding Least Terns, Common Terns, and one of the largest concentrations of breeding Piping Plovers in the state. Potential threats to nesting coastal waterbirds include predation and human disturbance. Off-road vehicle use at this site is an ongoing management issue. Annual protection from these threats is needed.

Core Habitat BM1278

Invertebrates

The shoreline of Hoxie Pond and other shallow wetlands with Water-willow are habitat for the Water-willow Stem Borer moth, a Threatened species that is found nowhere in the world outside of Massachusetts. This Core Habitat is located less than 10 km from other habitats for the Water-willow Stem Borer, including Core Habitats in Sandwich and Barnstable. This proximity allows for occasional movement of individual moths between these sites, which is important to maintain a viable population of this species. Apparently most of this Core Habitat is on unprotected land.

Core Habitat BM1291

Spanning the towns of Banstable and Sandwich, this Core Habitat is one of the last remaining undeveloped tracts of land of its size on Cape Cod. It encompasses pine/oak woodlands and barrens, as well as Coastal Plain ponds. Together these natural communities provide significant habitat for Eastern Box Turtles, rare invertebrates like the New England Bluet damselfly, and rare plants such as the Endangered Harsh Panic-grass.

Plants

One of only two known Massachusetts populations of the Threatened Rough Panic-grass occurs within a small portion of this Core Habitat. The New England Blazing Star, once more common in Massachusetts, can still be found here as well.

Invertebrates

This Core Habitat includes a diversity of habitats for rare invertebrate species, including Coastal Plain pondshores inhabited by the Comet Darner dragonfly and the New England Bluet damselfly. Open areas vegetated with shrubby oaks and wild flowers, such as the Barnstable Airport grounds, are habitat for the rare Oak Hairstreak butterfly.

Vertebrates

This large Core Habitat encompasses pine-oak woodlands and barrens characteristic of Cape Cod. The area provides significant habitat for Eastern Box Turtles. This Core Habitat supports significant habitat for a breeding population of the Eastern Towhee, a rapidly declining songbird in eastern North America.

Core Habitat BM1293

Natural Communities

This Core Habitat is part of a complex that makes up the largest contiguous acreage of Estuarine Intertidal Salt Marsh on Cape Cod. The Salt Marsh community type is a graminoid-dominated, tidally flooded coastal community with several vegetative zones. Salt Marshes form in areas subject to oceanic tides, but sheltered from wave energy. Here the Salt Marsh contains an excellent variety of microhabitats and consequently an excellent diversity of plants, algae, and animals. It is well-buffered by natural lands, including many other high-quality natural communities.

Core Habitat BM1332

Natural Communities

The Coastal Plain Pondshore community in this Core Habitat is part of a cluster of ponds in a mostly developed area. Coastal Plain Pondshores are globally rare herbaceous communities of exposed pondshores with a distinct Coastal Plain flora. Water levels change with the water table, typically leaving an exposed shoreline in late summer where many rare species grow. Small amounts of natural vegetation occur around most of the ponds here, helping to protect the shorelines. The pond in this Core Habitat and most of the ponds in the cluster are within the zones of groundwater contribution to several public water supply wells and are subject to lowering of the water table as a result. Each pond in the cluster contributes habitat for rare and more common species characteristic of Coastal Plain Ponds; together they can all contribute to maintaining the biodiversity of the ponds of the area.

Core Habitat BM1339

Natural Communities

This Core Habitat contains a Coastal Plain Pondshore community in excellent condition. Coastal Plain Pondshores are globally rare herbaceous communities of exposed pondshores with a distinct Coastal Plain flora. Water levels change with the water table, typically leaving an exposed shoreline in late summer where many rare species grow. Although somewhat affected by a small swimming beach and one public water supply well, the pondshore vegetation here is diverse and intact, much of the surrounding land is naturally vegetated, and no cranberry operations are in the vicinity.

BioMap: Core Habitat Summaries

Sandwich

Core Habitat BM1345

Natural Communities

The Coastal Plain Pondshore community in this Core Habitat is part of a cluster of ponds with some undeveloped areas around them. Coastal Plain Pondshores are globally rare herbaceous communities of exposed pondshores with a distinct Coastal Plain flora. Water levels change with the water table, typically leaving an exposed shoreline in late summer where many rare species grow. The pond here has natural vegetation around much of it; some natural vegetation occurs around most of the ponds in the cluster, helping to protect the shorelines. The pond in this Core Habitat and all the ponds in the cluster are within the zones of groundwater contribution to several public water supply wells and are subject to lowering of the water table as a result. Each pond in the cluster contributes habitat for rare and more common species characteristic of Coastal Plain Ponds; together they help maintain the overall biodiversity of the ponds of the area.

Core Habitat BM1350

Natural Communities

This Core Habitat contains a Coastal Plain Pondshore community in good condition despite several houses on its shore and its location within the zone of groundwater contribution for one public water supply well. Coastal Plain Pondshores are globally rare herbaceous communities of exposed pondshores with a distinct Coastal Plain flora. Water levels change with the water table, typically leaving an exposed shoreline in late summer where many rare species grow.

Core Habitat LW225

Invertebrates

Common Name	Scientific Name	Status
Eastern Pondmussel	*Ligumia nasuta*	Special Concern
Tidewater Mucket	*Leptodea ochracea*	Special Concern
Triangle Floater	*Alasmidonta undulata*	Special Concern

Living Waters: Core Habitat Summaries

Sandwich

Core Habitat LW225

The Mashpee-Wakeby Pond complex is a large water body comprised of two groundwater-fed kettlehole ponds. This pond complex is believed to be one of the most diverse and productive sites for freshwater mussels in southeastern Massachusetts, supporting seven of the state's twelve species. These species include three rare mussels: the Tidewater Mucket, the Triangle Floater, and a robust population of the Eastern Pondmussel.

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